QUATERNARY RESEARCH

An Interdisciplinary Journal

EDITOR
Stephen C. Porter

ASSOCIATE EDITOR
Estella B. Leopold

Volume 17, 1982

ACADEMIC PRESS
New York London
Paris San Diego San Francisco São Paulo Sydney Tokyo Toronto

Copyright © 1982 by the University of Washington

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (21 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1982 articles are the same as those shown for current articles.

MADE IN THE UNITED STATES OF AMERICA

CONTENTS OF VOLUME 17

NUMBER 1, JANUARY 1982

EDITORIAL ANNOUNCEMENT ii

E. MOSLEY-THOMPSON AND L. G. THOMPSON. Nine Centuries of Microparticle Deposition at the South Pole 1

ROGER BYRNE, ORMAN GRANGER, AND JOHN MONTEVERDI. Recent Rainfall Trends on the Margins of the Subtropical Deserts: A Comparison of Selected Northern Hemisphere Regions 14

L. C. PETERSON AND G. P. LOHMANN. Major Change in Atlantic Deep and Bottom Waters 700,000 yr Ago: Benthonic Foraminiferal Evidence from the South Atlantic 26

R. S. THOMPSON AND J. I. MEAD. Late Quaternary Environments and Biogeography in the Great Basin 39

W. A. WATTS AND J. PLATT BRADBURY. Paleoecological Studies at Lake Patzcuaro on the West-Central Mexican Plateau and at Chalco in the Basin of Mexico .. 56

CALVIN J. HEUSSER. Palynology of Cushion Bogs of the Cordillera Pelada, Province of Valdivia, Chile 71

RUDY J. NICKMANN AND JAMES M. DEMAREST, II. Pollen Analysis of Some Mid-Pleistocene Interglacial Lagoonal Sediments from Southern Delaware 93

CHARLOTTE A. BRUNNER. Paleoceanography of Surface Waters in the Gulf of Mexico during the Late Quaternary 105

NOTE

G. BRENT DALRYMPLE, R. M. BURKE, AND PETER W. BIRKELAND. Concerning K–Ar Dating of a Basalt Flow from the Tahoe–Tioga Interglaciation, Sawmill Canyon, Southeastern Sierra Nevada, California 120

LETTERS TO THE EDITOR

J. T. ANDREWS. Comment on "New Evidence from beneath the Western North Atlantic for the Depth of Glacial Erosion in Greenland and North America" by E. P. Laine 123

E. P. LAINE AND M. BELL. Reply to Andrews' Comment 125

WARREN L. PRELL. Reply to Comments by P. J. Webster and N. A. Streten Regarding "Surface Circulation of the Indian Ocean during the Last Glacial Maximum, Approximately 18,000 YBP" 128

ANNOUNCEMENTS 132

NUMBER 2, MARCH 1982

EDITORIAL ANNOUNCEMENT ii

R. G. JOHNSON. Brunhes–Matuyama Magnetic Reversal Dated at 790,000 yr B.P. by Marine–Astronomical Correlations 135

GLENN A. JONES AND WILLIAM F. RUDDIMAN. Assessing the Global Meltwater Spike 148

C. W. LANDMESSER, T. C. JOHNSON, AND R. J. WOLD. Seismic Reflection Study of Recessional Moraines beneath Lake Superior and Their Relationship to Regional Deglaciation 173

Richard B. Waitt, Jr., James C. Yount, and P. Thompson Davis. Regional Significance of an Early Holocene Moraine in Enchantment Lakes Basin, North Cascade Range, Washington 191

Diane R. Smith and William P. Leeman. Mineralogy and Phase Chemistry of Mount St. Helens Tephra Sets W and Y as Keys to Their Identification 211

G. Richard Whittecar and Anthony M. Davis. Sedimentology and Palynology of Middle Wisconsinan Deposits in the Pecatonica River Valley, Wisconsin and Illinois 228

Donald R. Whitehead, Stephen T. Jackson, Mark C. Sheehan, and Barbara W. Leyden. Late-Glacial Vegetation Associated with Caribou and Mastodon in Central Indiana 241

Randy F. Miller and Alan V. Morgan. A Postglacial Coleopterous Assemblage from Lockport Gulf, New York 258

Letter to the Editor

George Kukla and Alan Hecht. In Memory of Genevieve Woillard-Roucoux 275

New Books Received 276

Number 3, May 1982

Barbara Molfino, Nilva G. Kipp, and Joseph J. Morley. Comparison of Foraminiferal, Coccolithophorid, and Radiolarian Paleotemperature Equations: Assemblage Coherency and Estimate Concordancy 279

Paul Loubere. Plankton Ecology and the Paleoceanographic–Climatic Record . 314

Bruce H. Corliss, Allen S. Hunt, and Lloyd D. Keigwin, Jr. Benthonic Foraminiferal Faunal and Isotopic Data for the Postglacial Evolution of the Champlain Sea 325

Louis Scott. A Late Quaternary Pollen Record from the Transvaal Bushveld, South Africa 339

Scott A. Elias. Holocene Insect Fossils from Two Sites at Ennadai Lake, Keewatin, Northwest Territories, Canada 371

Stephen A. Hall. Late Holocene Paleoecology of the Southern Plains 391

Letters to the Editor

P. H. Robinson and J. R. Keys. Comment on "Late Pleistocene Glacial Chronology of the Taylor Valley, Antarctica, and the Global Climate," by Hendy, Healy, Rayner, Shaw, and Wilson (1979) 408

Nelson R. Gadd. Comment on Late Wisconsinan Glaciation Models of Northern Maine and Adjacent Canada 410

Andrew N. Genes and William A. Newman. Reply to Comments by N. R. Gadd on Late Wisconsinan Glaciation Models of Northern Main and Adjacent Canada 413

New Books Received 415

Book Reviews 418

Announcement 422

Author Index for Volume 17 423

The Subject Index for Volume 17 will appear in the November 1982 issue as part of a cumulative index for the year 1982.

QUATERNARY RESEARCH

An Interdisciplinary Journal

EDITORIAL POLICY

Quaternary Research is devoted to *interdisciplinary* articles dealing with the Quaternary Period. Editorial policy requires that articles must be of broad interest, of basic significance to more than one discipline, and of high merit. Previously unpublished research results, comprehensive reviews of a field of knowledge, and occasional English translations of outstanding articles in other languages will all be considered. Generally, articles should be in English, but a small proportion of articles in French, German, or Russian will be accepted. Articles should not exceed 5000 words, but exceptions can be made for especially significant contributions. All articles will be reviewed by at least two referees.

Manuscripts and figures should be submitted at least in duplicate (a third copy could speed processing) to:

Quaternary Research
Editorial Office
University of Washington
Seattle, Washington 98195

Manuscripts are accepted for review with the understanding that the same work has not been and will not be published nor is presently submitted elsewhere, and that all persons listed as authors have given their approval for the submission of the paper; further, that any person cited as a source of personal communications has approved such citation. Written authorization may be required at the Editor's discretion. Articles and any other material published in *Quaternary Research* represent the opinions of the author(s) and should not be construed to reflect the opinions of the Editor(s) and the Publisher.

Authors submitting a manuscript do so on the understanding that if it is accepted for publication, copyright in the article, including the right to reproduce the article in all forms and media, shall be assigned exclusively to the University. The University will not refuse any reasonable request by the author for permission to reproduce any of his or her contributions to the journal.

INSTRUCTIONS TO AUTHORS

General Instructions

Manuscripts should be written in clear and concise English and should conform to the general style of the journal and the specific instructions listed below. Manuscripts that are not adequately prepared will be returned to the authors, since it is not feasible for the Editors to revise or rewrite manuscripts. Contributors, particularly those unfamiliar with English usage, are encouraged to seek the help of colleagues in the preparation and review of manuscripts prior to submission. This practice reduces the time required for review and avoids delays in publication.

Form and Style. Manuscripts should be concise but detailed enough to permit critical appraisal. They should be typewritten and double-spaced throughout (including tables, legends, and footnotes) on one side of approximately 22- × 23-cm (8.5- × 11-in.) paper with 2.5-cm (1-in.) margins. Tables and figure legends should by typed separately and placed at the end of the manuscript. All pages, beginning with the title page and including tables and figure legends, should be numbered consecutively and fastened securely. The title page should include the article title, author(s), affiliation(s) and address(es), and suggestions for index entries. Addresses should include zip codes or postal districts when applicable. All correspondence regarding the manuscript will be made with the person submitting the manuscript.

Authors are requested to include an Abstract (50–200 words, typed on a separate page following the title page). The Abstract should be a concise and informative summary that can be copied verbatim by bibliographers. The title must be suitable for indexing.

Units. Metric units should be used throughout, with English equivalents in parentheses if originally given in English units. When used in conjunction with numerals, units should be abbreviated and unpunctuated (e.g., cm, g, %). Use the American Chemical Society Handbook as a guide.

Numbers. Numbers less than 10,000 should be expressed without a comma (e.g., 5455) but those of greater value should have a comma or commas separating each triad of digits (e.g., 15,640; 1,200,000).

Dates. Historical dates should be expressed as years B.C. or A.D. (e.g., 1850 A.D.; 2000 B.C.). Radiocarbon dates should be expressed in ^{14}C yr B.P. (before present) and should include the standard error as well as the laboratory number (e.g., 14,730 ± 150 yr B.P. (Y-661)). If the dates have been corrected for atmospheric variations in radiocarbon, the calibrated dates should be reported as calendar years (e.g., 500 B.C.* or 2450 B.P.*) and

the calibration table specified. K/Ar dates should also include the standard error; dates less than 1 million years old should be written out (e.g., 150,000 ± 10,000 yr), but dates of a million or more years may be expressed in my (e.g., 2.43 my). If laboratory numbers have been designated, they should be given in parentheses following the date (e.g., 2.43 my (QL_K-10)).

Chemical Notation. International notation should be employed in all cases (e.g., ^{18}O, ^{14}C, ^{40}K).

Temperature Notation. Temperatures should be expressed in degrees Celsius (°C), with Fahrenheit equivalents in parentheses if originally reported in such units (e.g., 6°C; 20°C (68°F)).

Illustrations and Tables. All illustrations and tables should be cited somewhere in the body of the paper and in sequence (e.g., ". . . as illustrated in Figure 5"; ". . . in the region (Fig. 5)"; "Figure 4 shows . . ."; ". . . in Alaska and California (Figs. 4 and 5)"; "The values in Table 6 are taken from . . ." ". . . the data obtained in this study (Table 1)."")

Footnotes. Footnotes in the *text* should be identified by superscripts consisting of Arabic numerals and should be typed on a separate sheet; footnotes in the *tables* should be identified by superscripts consisting of the lowercase letters a, b, c, etc., and placed at the bottom of the table.

Tables. Tables should be denoted by Arabic numerals and cited consecutively in the text. Each table should be titled and typed double-spaced on a separate sheet. *Units must be clearly indicated for each of the column entries in the table.*

Figures. All figures should be denoted by Arabic numerals and cited consecutively in the text, with figure legends typed on a separate sheet. Units should be clearly indicated in the figures themselves.

Please Note: All figures are to be submitted in such form as to permit photographic reproduction without retouching or redrawing, including the lettering. Lettering is reproduced as part of the photoengraving and is not set in type. Line drawings should be carefully drafted with black India ink on white drawing paper or blue drafting cloth, if possible no larger than 22- × 28-cm (8.5- × 11-in.) overall. The lettering should be large enough to allow a 50% reduction. High-quality glossy prints are acceptable for drawings and required for photographs. Color plates or fold-out illustrations cannot be accommodated unless financed by the author.

References. References should be cited in the text by author's surname and date such as "Doe (1970) reported that . . ." ". . . as previously reported (Doe *et al.*, 1970)." Suffixes (a, b, etc.) should be used to distinguish two or more works by the same author(s) in the same year; *e.g.*, Doe (1971a, 1971b). *Page numbers should be given whenever practicable.* A direct quotation should always be page referenced; a paraphrased statement should be page referenced if the article exceeds 10 pages. The reference section should be arranged alphabetically according to the author's surname. Order of items: author(s), date of publication, title of article, journal or book title (written out in full rather than abbreviated), volume number, inclusive pages, and (for books only) publisher and city, e.g.:

Zin, S. (1971a). The problem of Quaternary climatic changes. *Quaternary Research* 1, 1–10.

Falk, B., and Li, M. (1972). "The Cause of Quaternary Climatic Changes." Vol. 1. Academic Press, New York.

Cohen, R. (1967). The equatorial ionosphere. *In* "Physics of Geomagnetic Phenomena." (S. Matsushita and W. H. Campbell, Eds.), Vol. 1, pp. 561–613. Academic Press, New York

Author's alterations in excess of 10% of the cost of composition will be charged to the author.

Reprints. 50 reprints of each article will be supplied free of charge. Additional reprints can be ordered on the form accompanying galley proof.